

COAL NONFATAL

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UNITED STATES
DEPARTMENT OF LABOR
MINE SAFETY AND HEALTH ADMINISTRATION

District 9



REPORT OF INVESTIGATION
(UNDERGROUND COAL MINE)

COAL MINE GAS AND/OR DUST (FRICTIONAL) IGNITION

Price River No. 3 Mine (I.D. No. 42-00165)
Price River Coal Company, Inc.
Helper, Carbon County, Utah

May 29, 1980

by

Jerry O.D. Lemon
Coal Mine Inspector

Originating Office - Mine Safety and Health Administration
Drawer J, 575 East First South, Price, Utah 84501
Jensen L. Bishop, Subdistrict Manager

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HEADGATE

No. 15 Chock
556 Ft./Min. Air

Face Conveyor

-No. 55 Chock
450 Ft./Min.
Air

Methane Monitor

TAILGATE

Previously Mined Out

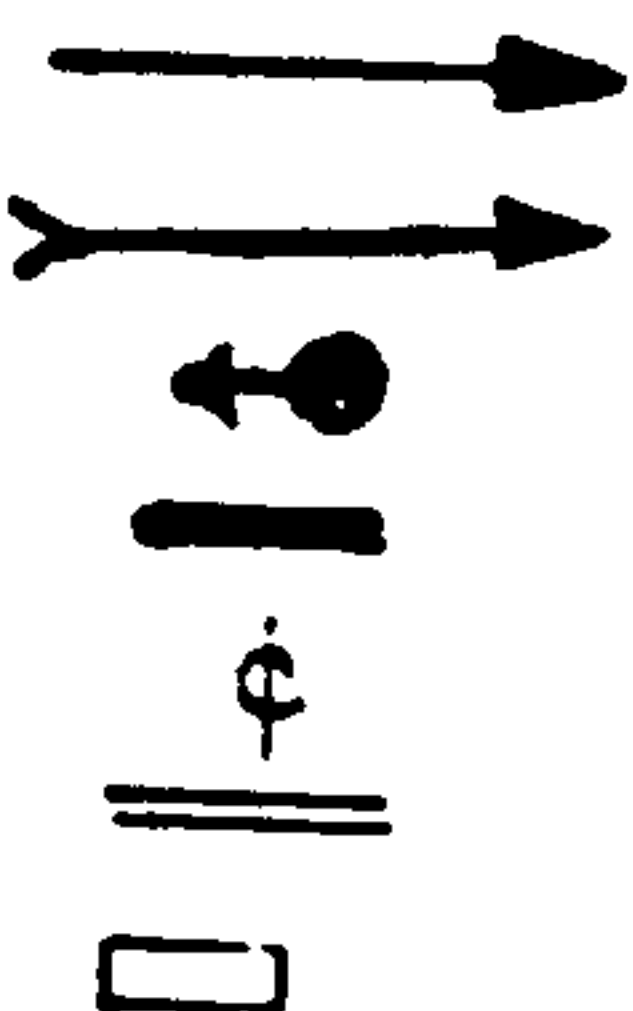
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LEGEND



Intake Air

Return Air

Ignition Location

Shearing Machine

Check Curtain

Permanent Stopping

Area Supported with 500 ton capacity
4 leg chocks

SCALE 1 INCH = 100 FEET
(Equipment not to scale)

Abstract of Investigation

U.S. Department of Labor
Mine Safety and Health Administration



Authority —

This report is based on an investigation made pursuant to the Federal Mine Safety and Health Act of 1977, Public Law 95-173, as amended by Public Law 95-164.

SECTION A — IDENTIFICATION DATA

1. Title of investigation: Coal Mine Gas and/or Dust (Frictional) Ignition
2. Date MESA investigation started: May 29, 1980
3. Report release date: September 11, 1980
4. Mine: Price River No. 3
5. Mine ID number: 42-00165
6. Company: Price River Coal Company, Inc.
7. Town, County, State: Helper, Carbon, Utah
8. Author(s): Jerry O.D. Lemon

SECTION D — ORIGINATING OFFICE

18 Mine Safety and Health Administration
Coal Mine Health and Safety District No.: 9
Address: Drawer J, Price, Utah 84501

SECTION B — MINE INFORMATION

9. Daily production: 1,900
10. Surface employment: 31
11. Underground employment: 238
12. Name of coalbed: Castle Gate Sub 3
13. Thickness of coalbed: 6 to 7 feet

SECTION C — LAST QUARTERLY TEMPERATURE FREQUENCY RATE (HSAS) FOR

14. Industry: 11.50
15. This operation: 10.02
16. Training program approved: yes
17. Mine Profile Rating: 723

SECTION E — ABSTRACT

Thursday, May 29, 1980, about 5:05 p.m., a small coal mine gas and/or dust (frictional) ignition occurred about 16 feet from the tailgate corner in the 6th east longwall section of the Price River No. 3 Mine. The Anderson Mavor double drummed shearing machine was cutting bottom when a bounce occurred. The machine was deenergized and the dust allowed to clear. Tests for methane were conducted and the machine was started again. Frictional heat generated by the cutting bits on the tailgate drum contacting the hard sandstone floor ignited gas and/or dust. Flame was orange in color about 6 inches by 18 inches and automatically extinguished. No injuries or property damage resulted.

SECTION F — MINE ORGANIZATION

- | Company officials: | Name | Address |
|----------------------------------------------|---------------------------|------------------------------------------------|
| 19. President: | <u>W.S. White</u> | <u>2 Broadway, New York, New York 10004</u> |
| 20. Superintendent: | <u>John Sharknas</u> | <u>Box 629, Helper, Utah 84526</u> |
| 21. Safety Director: | <u>John O'Green</u> | <u>Box 629, Helper, Utah 84526</u> |
| 22. Vice President
Principal officer—H&S: | <u>Gordon Cook</u> | <u>Box 629, Helper, Utah 84526</u> |
| 23. Labor Organization: | <u>UMWA - District 22</u> | <u>23 South Carbon Ave., Price, Utah 84501</u> |
| 24. Chairman—H&S Committee: | <u>Paul M. Richey</u> | <u>82 Bryner Street, Helper, Utah 84526</u> |

Commentary

Thursday, May 29, 1980, about 4:05 p.m., the 6th east longwall crew under the supervision of Mike Martinez, section foreman, entered the mine and proceeded to the section, arriving there about 4:40 p.m. Martinez examined the section, issued various work assignments to crew members and the daily routine of work commenced. The Anderson Mavor double drummed shearing machine had been left parked near the tailgate corner of the face by the previous shift. It was necessary to make several grading cuts from no. 95 to no. 103 chock which was accomplished without incident. The shearing machine then began traveling from the tailgate towards the headgate with both drums cutting bottom. When the tailgate drum reached no. 101 chock a small bounce occurred along this area of the face which sloughed loose coal against the machine between the cutting drums. The shearing machine was deenergized immediately. The dust, generated from the bounce, was allowed to clear and tests for methane were taken with a permissible hand held detector 1 foot from the face and roof at several locations around the shearing machine and only 0.2 percent methane was indicated. The shearing machine was again energized and when the cutting drums began rotating, a flame described as orange in color, about 18 inches wide and 6 inches in height was observed between the tailgate drum and metal cowl. The machine was deenergized and according to witnesses the flame automatically extinguished. Time of the occurrence was estimated to be about 5:05 p.m. Tests for methane were again taken 1 foot from the face, roof and floor at various locations with a permissible hand held detector and only 0.2 percent methane was indicated, however when the detector was held in close proximity to the mine floor where the flame was observed 0.2 to 0.6 percent methane was indicated.

Martinez notified mine officials of the occurrence. The Price, Utah Subdistrict Office of the Mine Safety and Health Administration was subsequently notified and an investigation was conducted promptly.

Discussion and Evaluation

The investigation revealed the following factors relevant to the occurrence.

1. The coal seam in 6th east longwall section averaged about 72 inches in thickness with a hard sandstone floor and laminated sandy shale immediate roof. Full seam extraction was practiced.
2. The longwall face was approximately 500 feet long. One hundred and three Dowty, four leg 500 ton capacity chocks were utilized for roof support. An Eickoff armored conveyor equipped with a single strand conveyor chain served as a coal haulage system for the face as well as a track for the shearing machine.
3. The shearing machine was an Anderson Mavor 300 hp, 900 volt AC model AB-16, equipped with two 54 inch diameter, 30 inch wide ranging cutting drums which rotated at 61 r.p.m. Trimming speed was variable from 5 to 28 feet per minute. Each cutting drum was provided with an adjustable metal cowl.
4. The longwall system was provided with a MSA Mark VI methane monitor which was tested with a known mixture of methane and was found to be functioning properly. The red warning light came on at 1.0 percent methane and the electrical equipment was deenergized at 1.8 percent methane. The sensor head was attached to the no. 103 chock at the tailgate return end of the longwall face.
5. Electrical equipment on the section was examined and found to be in a permissible condition.
6. Each cutting drum was equipped with 33 heavy gauge 3 inch American Mine Tool bits, set in a special spiral configuration to induce fast movement of cut coal to the armored conveyor. The bits were examined and found to be in good condition.
7. Water sprays provided for bit cooling and dust suppression purposes consisted of the following.
 - a. Each cutting drum was provided with 33 small sprays located along the bit holder spiral, designed and located in such a way, that water reached the forward cutting edge of each bit. In addition three sprays were provided on the face side of each drum.
 - b. Each ranging arm was equipped with a hinged crescent shaped spray bar equipped with 11 BD 3 spray heads.The water spray system was examined and found to be in a good operating condition. Water pressure was measured at each crescent shaped spray bar, 250 p.s.i. was indicated on the headgate end and 225 p.s.i. was indicated on the tailgate end. Although water volume was not measured it was estimated that about 100 gallons of water per minute would flow through the water spray system at pressures as indicated.

8. There was 50,400 cubic feet of air a minute entering the intake end of the longwall face. The velocity of the air current at no. 15 chock was 556 feet per minute and at no. 55 chock was 450 feet per minute.

9. During the investigation tests for methane were made at various locations along the longwall face with a permissible hand held methane detector 1 foot from the face, roof and floor and only 0.1 to 0.2 percent methane was indicated, however, when the detector was held in close proximity to the mine floor where the flame was observed, the indicating needle fluctuated from 0.2 to 0.4 percent methane. Tests in the immediate return of the longwall face indicated 0.2 percent methane.

10. During the investigation it was determined that the cutting bits on the tailgate drum had penetrated the hard sandstone floor. The shearing machine operator failed to raise the tailgate drum above the mine floor before rotation was started after the bounce occurred. Consequently frictional heat was generated immediately when the drum started to rotate.

11. A bounce occurred along the longwall face where the shearing machine was cutting bottom which sloughed loose coal against the machine between the cutting drums. It was theorized that methane was released from a small feeder on the mine floor when the bounce occurred and was trapped in the loose coal at the tailgate drum, and was subsequently ignited by frictional heat.

12. There was no evidence of burning in the form of smoke residue or odor at the reported ignition site. Reportedly the flame was small and automatically extinguished immediately.

13. The company had additional fire fighting equipment provided along the longwall face as follows:

a. A 10 pound multipurpose dry chemical fire extinguisher was provided on the shearing machine.

b. A special water hose, with valve, was attached to the shearing machine water system long enough to reach beyond each cutting drum for emergency use.

c. Several dry chemical fire extinguishers were placed in the longwall face chocks at strategic locations.

14. Generally methane is liberated from the hard sandstone mine floor in the form of feeders which is conducive to frictional ignitions. Many innovations have been tried by this company to reduce the occurrence of frictional ignitions, such as increased quantity and pressure of water. Various positions and types of spray heads. Various kinds of cutting bits and angle or position of bits. Special cutting sequence to increase ventilation at the cutting drums. Increased volume and velocity of ventilating air along the longwall face. Variations of shearing machine tramming speeds. Blasting of rock spars before shearing operations to reduce frictional heat from the cutting bits, etc.

Findings of Fact

The investigation did not reveal any violation of title 30 CFR, part 75, which would have contributed to the cause of the occurrence.

Conclusion

It was the consensus of the investigation committee that the ignition occurred due to the occurrence of several items.

1. A small bounce occurred at the tailgate end of the longwall face which sloughed loose coal against the shearing machine between the cutting drums which restricted ventilation.
2. Methane was released from a small feeder in the mine floor and was trapped in the loose coal at the tailgate cutting drum.
3. Frictional heat was generated when the cutting bits on the tailgate drum was rotated against the hard sandstone floor which ignited the trapped methane and/or dust.

Respectfully submitted,

Jerry O.D. Lemon

Jerry O.D. Lemon

Approved:

Jensen L. Bishop

Jensen L. Bishop
Subdistrict Manager

APPENDIX

List of persons furnishing information and/or present during the investigation.

Price River Coal Company, Inc. Officials

John Sharknas	Mine Superintendent
John O'Green	Safety Director
Marty Zackreson	Longwall Maintenance Superintendent
Mike Martinez	Longwall Section Foreman
Victor Stewart	Safety Inspector
Dale Stapley	Safety Inspector

Price River Coal Company, Inc. Employees

R. McKinnon	Shearing Machine Operator
J. Salas	Shearing Machine Operator
R. Deguilio	Headgate Cornerman
P. Houghton	Mechanic
E. Romero	Gas Watcher
L. Vasquez	Propman
J. Aldaba	Propman
B. Johnson	Propman
M. Warenski	Propman
F. Mabbitt	Belt Man
A. Arroyo	Propman
M. Thatcher	Electrician

Representative of Miners United Mine Workers of America

Fred Lupo	Safety Committeeman and President Local 8303
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Mine Safety and Health Administration

Fred W. Tatton, Jr.	Coal Mine Inspection Supervisor
Jerry O.D. Lemon	Coal Mine Inspector